

Mission Incident  
Santa Paula, CA  
Preliminary Summary of Air Monitoring Results  
December 20, 2014

Prepared by  
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)

## Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 20, 2014 07:00 to December 21, 2014 07:00.

## Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine ( $\text{Cl}_2$ ), hydrogen sulfide ( $\text{H}_2\text{S}$ ), hydrochloric acid ( $\text{HCl}$ ), percent of the Lower Explosive Limit (LEL), oxygen ( $\text{O}_2$ ), peroxides, particulate matter (10 micron particles,  $\text{PM}_{10}$ ), sulfur dioxide ( $\text{SO}_2$ ), sulfuric acid ( $\text{H}_2\text{SO}_4$ ), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect  $\text{Cl}_2$ , VOCs, LEL,  $\text{H}_2\text{S}$ , and  $\text{SO}_2$ . An additional unit (Unit 06) was deployed in conjunction with work operations near frac tanks as recommended by the onsite safety officer. Units 09 and 10 were deployed in the cabs of excavators supporting solidification operations in the Exclusion Zone. AreaRAE Unit 11 was deployed on Mission Rock Road on the outer fence line of the Santa Clara Waste Water facility primarily to monitor  $\text{Cl}_2$  concentrations between the 120 barrel tank truck and the road. Unit 11 recorded  $\text{Cl}_2$  concentrations ranging from 0.1 – 1.4 ppm; however, upon investigating the area with handheld instruments, responders did not detect any  $\text{Cl}_2$  in the area around the 120 barrel tank truck, and the AreaRAE's  $\text{Cl}_2$  sensor was recalibrated. Unit 02 recorded one instantaneous detection of  $\text{H}_2\text{S}$  at a concentration of 1.2 ppm at 17:38 on 12/20. This concentration was not sustained, and field personnel in the area did not detect  $\text{H}_2\text{S}$  with handheld instrumentation during this time. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE stations 1, 2, and 4 and data-logged to monitor  $\text{PM}_{10}$ . Additional units were data-logged and placed in the cab with operators in excavators supporting solidification operations in the Exclusion Zone. Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary<sup>1</sup>  
December 20, 2014 07:00 – December 21, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range <sup>2</sup>
Community	Cl <sub>2</sub>	Gastec 8La	6	0	NA	<0.05 ppm
	H <sub>2</sub> S	MR+ / MR Pro	27	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O <sub>2</sub>	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM <sub>10</sub>	AM510/Dusttrak	24	24	0.01	0.004 - 0.022 mg/m <sup>3</sup>
	SO <sub>2</sub>	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H <sub>2</sub> SO <sub>4</sub>	Gastec 35	6	0	NA	<0.2 mg/m <sup>3</sup>
	VOC	MR+ / MR Pro	27	0	NA	<0.1 ppm
Exclusion Zone	Cl <sub>2</sub>	Gastec 8La	1	0	NA	<0.05 ppm
		MR+ / MR Pro	1	0	NA	<0.1 ppm
	H <sub>2</sub> S	MR+ / MR Pro	1	0	NA	<1 ppm
Work Area	Cl <sub>2</sub>	Gastec 8La	5	1	0.05	0.05 - 0.05 ppm
		MR+ / MR Pro	31	4	0.3	0.3 - 0.3 ppm
	H <sub>2</sub> S	MR+ / MR Pro	16	0	NA	<0.1 ppm
	HCl	Gastec 14L	3	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O <sub>2</sub>	MR+ / MR Pro	11	11	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	2	0	NA	<0.1 ppm
	PM <sub>10</sub>	AM510/Dusttrak	10	10	0.076	0.01 - 0.352 mg/m <sup>3</sup>
	SO <sub>2</sub>	Gastec 5Lb	1	0	NA	<5 ppm
		MR+ / MR Pro	26	0	NA	<0.1 ppm
	H <sub>2</sub> SO <sub>4</sub>	Gastec 35	4	0	NA	<0.2 mg/m <sup>3</sup>
	VOC	MR+ / MR Pro	28	1	0.4	0.4 - 0.4 ppm

<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary<sup>1</sup>  
December 20, 2014 07:00 – December 21, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range <sup>2</sup>
Unit 01	H <sub>2</sub> S	5158	400	0.1 ppm	0.1 - 0.7 ppm
	LEL	5158	0	NA	< 1 %
	SO <sub>2</sub>	5158	0	NA	< 0.1 ppm
	VOC	5158	0	NA	< 0.1 ppm
Unit 02	H <sub>2</sub> S	4631	148	0.1 ppm	0.1 - 1.2 ppm
	LEL	4631	0	NA	< 1 %
	SO <sub>2</sub>	4631	0	NA	< 0.1 ppm
	VOC	4631	3	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H <sub>2</sub> S	5181	0	NA	< 0.1 ppm
	LEL	5181	0	NA	< 1 %
	SO <sub>2</sub>	5181	0	NA	< 0.1 ppm
	VOC	5181	150	0.2 ppm	0.1 - 0.8 ppm
Unit 04	H <sub>2</sub> S	4611	1	0.1 ppm	0.1 - 0.1 ppm
	LEL	4611	0	NA	< 1 %
	SO <sub>2</sub>	4611	0	NA	< 0.1 ppm
	VOC	4611	0	NA	< 0.1 ppm
Unit 06	H <sub>2</sub> S	145	0	NA	< 0.1 ppm
	LEL	145	0	NA	< 1 %
	SO <sub>2</sub>	145	0	NA	< 0.1 ppm
	VOC	145	43	0.1 ppm	0.1 - 0.1 ppm
Unit 09	Cl <sub>2</sub>	1793	0	NA	< 0.1 ppm
	LEL	1793	0	NA	< 1 %
	SO <sub>2</sub>	1793	0	NA	< 0.1 ppm
	VOC	1793	347	0.4 ppm	0.1 - 0.8 ppm
Unit 10	Cl <sub>2</sub>	1797	232	0.2 ppm	0.1 - 0.9 ppm
	LEL	1797	0	NA	< 1 %
	SO <sub>2</sub>	1797	22	0.1 ppm	0.1 - 0.1 ppm
	VOC	1797	881	0.4 ppm	0.1 - 2.3 ppm
Unit 11	Cl <sub>2</sub>	5147	47	0.5 ppm	0.2 - 1.4 ppm
	LEL	5147	0	NA	< 1 %
	SO <sub>2</sub>	5147	20	0.1 ppm	0.1 - 0.5 ppm
	VOC	5147	34	0.1 ppm	0.1 - 0.2 ppm

<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM<sub>10</sub> Monitoring Summary<sup>1</sup>  
December 20, 2014 07:00 – December 21, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
<b>10601072</b>	AR01	662	662	0.013	0.005 - 0.213 mg/m <sup>3</sup>
<b>10408087</b>	AR02	1014	1014	0.026	0.008 - 0.951 mg/m <sup>3</sup>
<b>10503020</b>	AR04	1966	1966	0.018	0.003 - 0.166 mg/m <sup>3</sup>
<b>10901027</b>	Excavator 200D	373	373	0.013	0.001 - 0.092 mg/m <sup>3</sup>
<b>10601073</b>	Excavator 210G	2352	2352	0.017	0.003 - 0.364 mg/m <sup>3</sup>

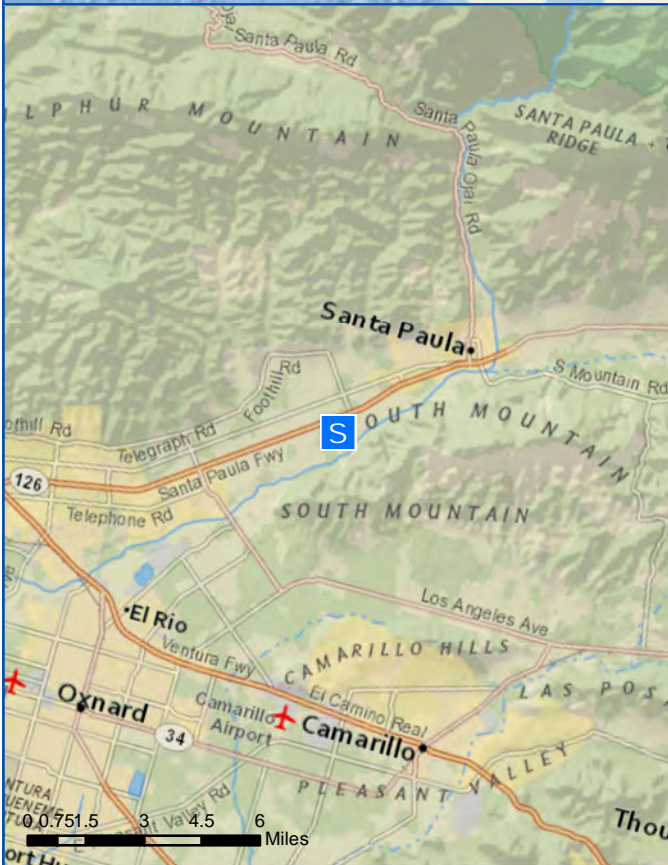
<sup>1</sup>Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

# Appendix A

## Incident Maps:

### Real-time Air Monitoring Locations and Incident Site





**Legend**  
 Site Location



0 50 100  
Feet





0 250 500 1,000  
Feet



## Legend

- FRT Location
- Site Location

















## Legend

### Monitoring Location

- Non-detect (< 1 %)
- S Incident Site













## Legend

### Monitoring Location

- Detect (0.004 - 0.352 mg/m<sup>3</sup>)
- S Incident Site

0 0.125 0.25 0.5 Miles









## Legend

### Monitoring Location

- Non-detect (< 0.2 mg/m<sup>3</sup>)
- S Incident Site

0 0.125 0.25 0.5 Miles







# Appendix B:

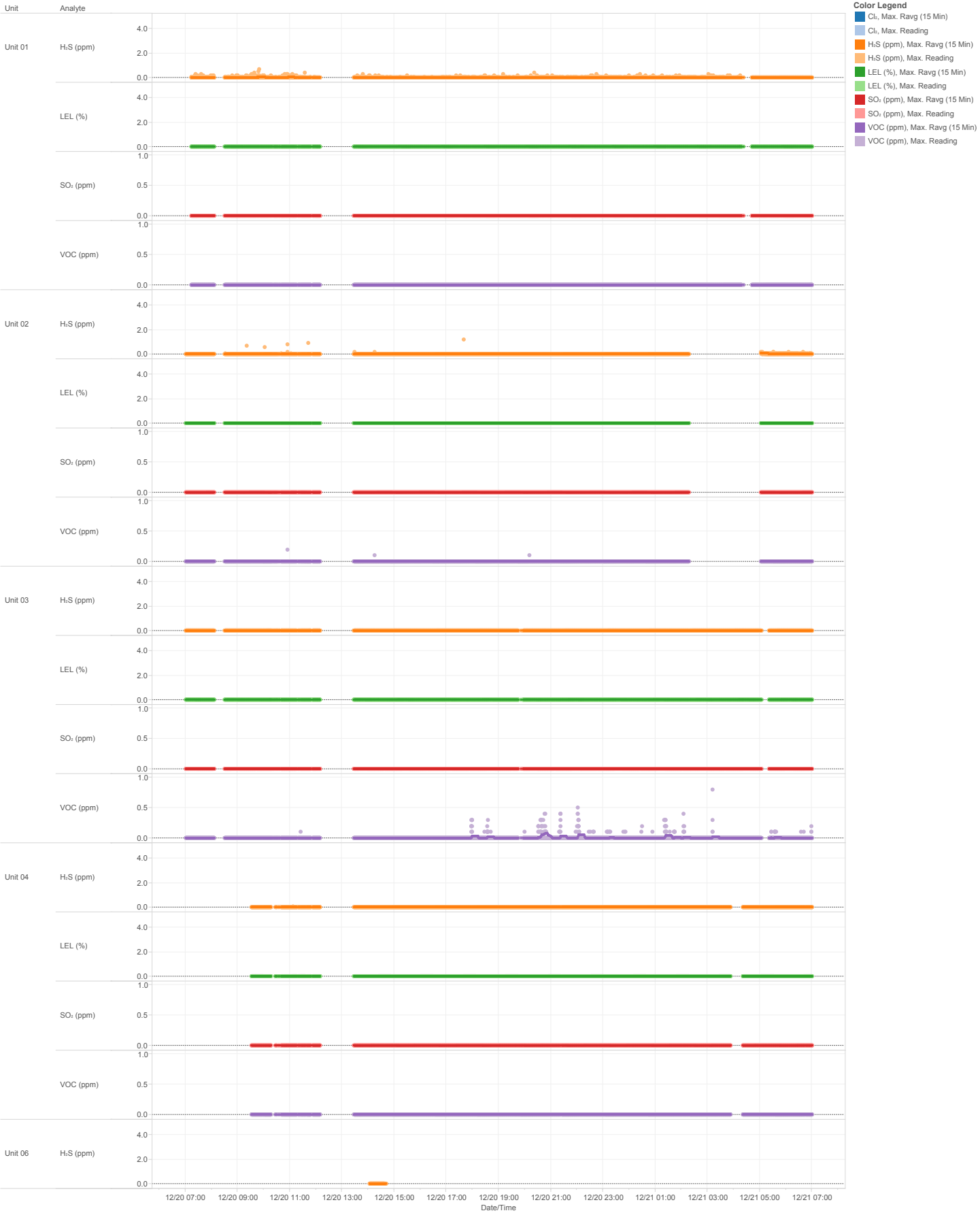
## AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map







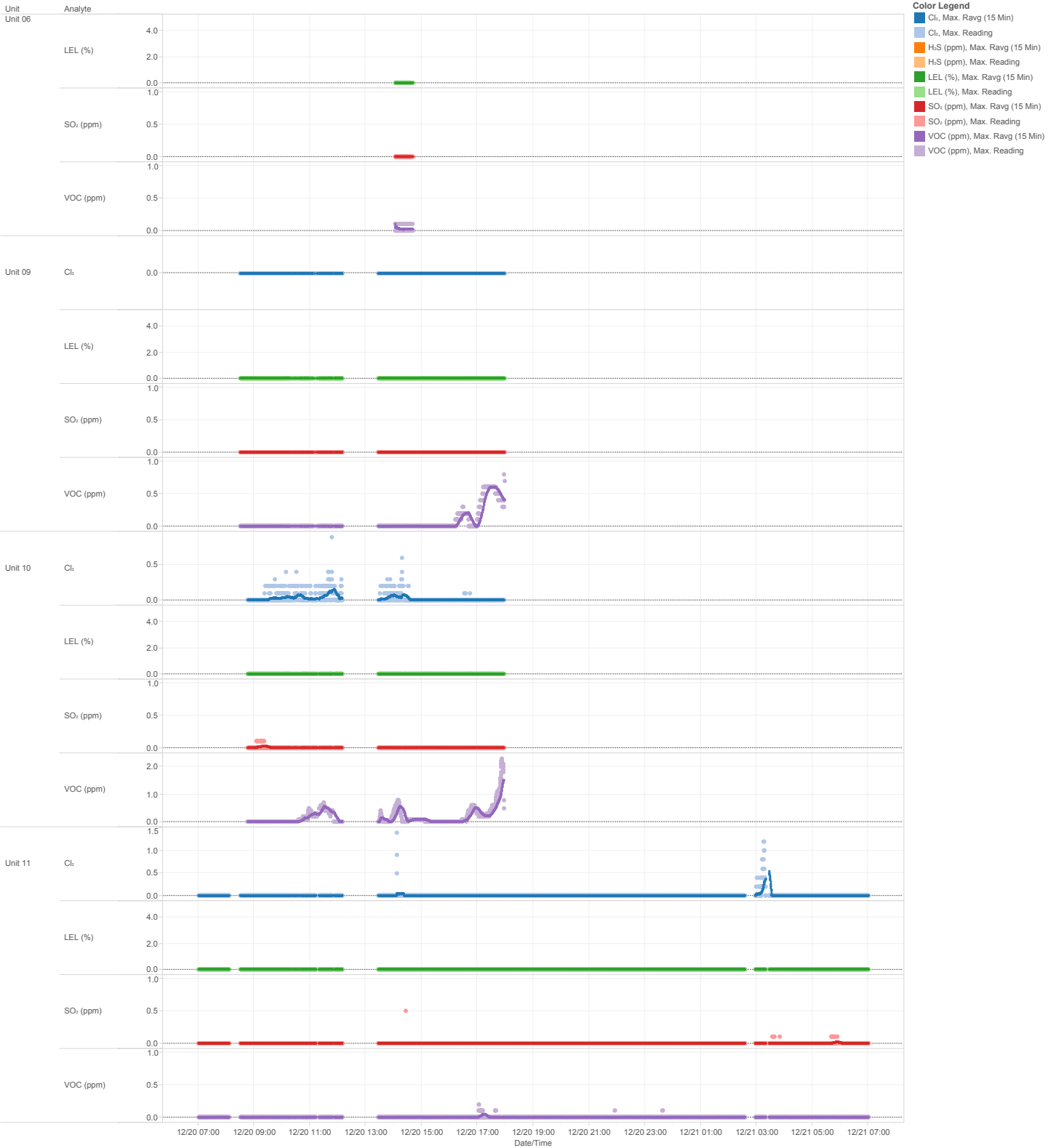
Patriot Environmental  
AreaRAE Trend Graphs  
12/20/2014 07:00 - 12/21/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format  
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"



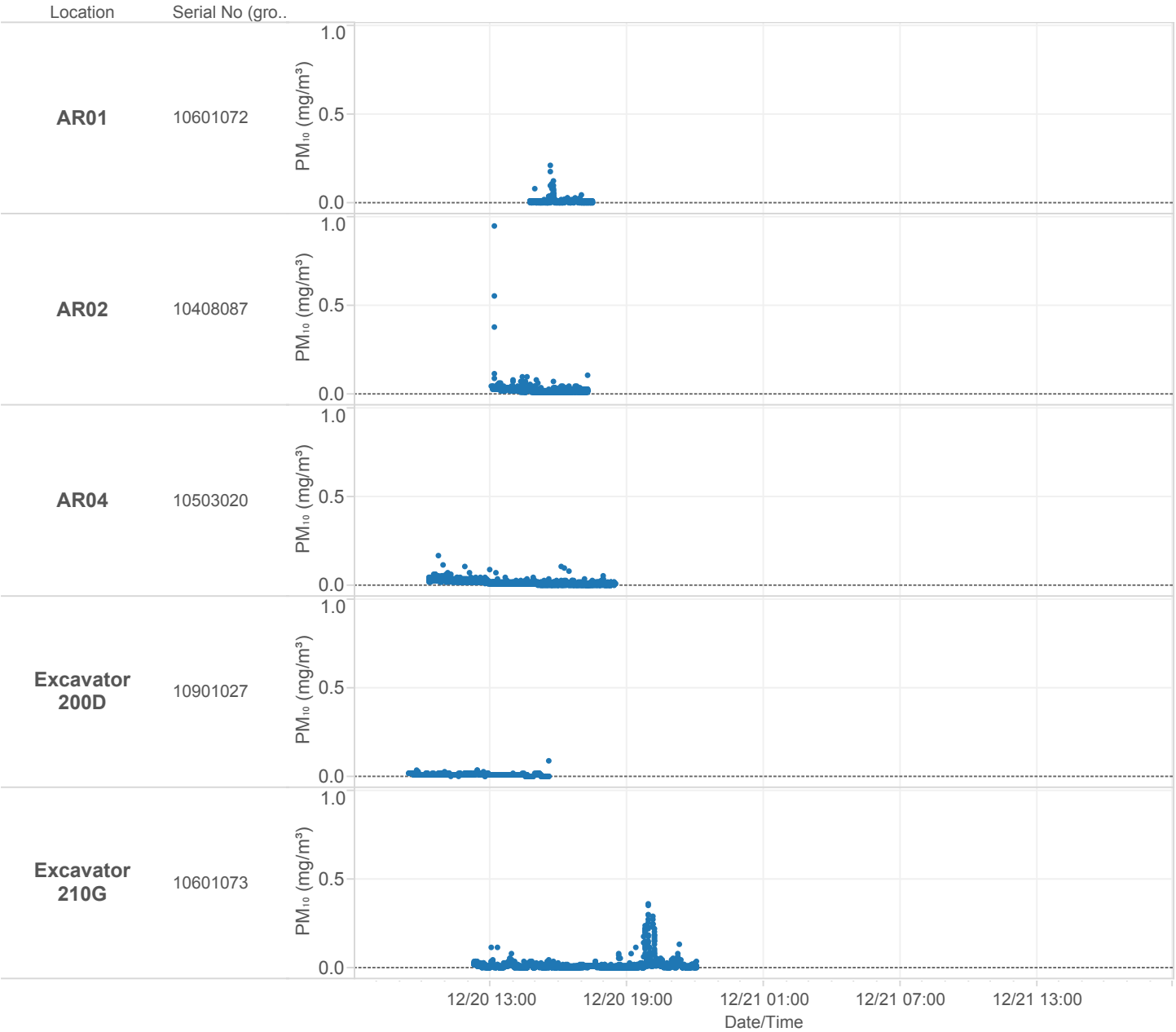
Patriot Environmental  
AreaRAE Trend Graphs  
12/20/2014 07:00 - 12/21/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.  
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"



Patriot Environmental  
MISSION INCIDENT  
Datalogged AM510 (PM<sub>10</sub>) Summary  
12/19/2014 07:00 - 12/20/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format